Coil-based electronic & electrical components (such as coils, transformers, filters and motors) based on nanotechnology.

ABSTRACT

Coils coupled to magnetically soft cores are a very important building block in today's electronics, used for manipulating electromagnetic fields. They are very important, for example, for transformers, inductors, filters, oscillators, and motors. Apart from permeability, the most important characteristics of such cores are high flux density and low core losses. The smaller the magnetic pieces within the typically ceramic substance of the core can become, the better the permeability, high flux density, and low core losses, which means also faster reaction times. The present invention is intended to improve the efficiency and abilities of coils by using, instead of typical Ferrite cores, a core based on a substance containing nano-structures, which can be for example Bucky Balls or Bucky tubes. Various possible variations and combinations of this are shown. Another possible variation is using for example long macro-size Bucky tubes or bundles of them also as wires for the coil itself, since this makes the improvement of the coil's performance even much better because of the much higher conductivity of these wires compared to copper. Therefore, the main problem for having also this additional feature is how to create longer nano-tubes for the wires. Various possible preferable solutions to this problem are discussed.